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09/658,538	09/09/2000	Paul Robert Williams	1136/190-P00028US	3472

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EXAMINER
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CHAU, COREY P

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 02/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/658,538	<b>Applicant(s)</b> WILLIAMS, PAUL ROBERT	
	<b>Examiner</b> Corey P. Chau	<b>Art Unit</b> 2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15, 19-22, 26-34 and 38-47 is/are rejected.
- 7) ☐ Claim(s) 16-18, 23-25, 35-37, 48-50 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                    | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the “removing the at least one notch filter if the amplitude of the frequency being tested has not been reduced by at least the predetermine value”, in Claim 1, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Objections***

2. Claim 6 is objected to because of the following informalities: on line 1, the status identifier recites "Previously amended", which should be replaced with "Previously presented". Appropriate correction is required.

3. Claim 15 objected to because of the following informalities: on line 6, recites "the new bin value **to to** at least one", which should be replaced with "the new bin value to at least one". Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The application recites in Claim 1, "removing the at least one notch filter if the amplitude of the frequency being tested has not been reduced by at least the predetermined value". However, no details are given as to how to removing the at least one notch filter if the amplitude of the frequency being tested has not been reduced by at least the predetermined value and thus one of ordinary skill in the art would be unable to actually make and use the invention. In this regards, the specification is merely an invitation to

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experiment, i.e. Applicant is requiring the public to disclose how to make the invention work, as opposed to disclosing it to the public. Claims 2-6 depends on Claim 1, which is rejected above.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 31, and 38 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 31 recites the limitation "the software" in line 1.

Claim 38 recites the limitation "the notch depth" in line 17.

There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 7-15, 19-22, 26-34, and 38-47 are rejected under 35 U.S.C. 102(b) as being anticipated by US. Patent No. 5677987 to Seki et al (hereafter as Seki).

11. Regarding Claim 7, Seki discloses method of reducing unwanted acoustical feedback (i.e. feedback detector and suppressor) in a space having at least one

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microphone for transducing acoustic signals into electrical input signals (i.e. input terminal 1 is connected to an external microphone) and at least one speaker for transducing electrical output signals into acoustic signals (i.e. output signal from the output terminal 6 is reproduced by a speaker)(column 5, lines 1-22); the method comprising:

converting electrical input signals to corresponding digital input signals (2);

examining the digital input signals for at least one candidate signal of unwanted acoustical feedback (7,8);

adjusting at least one digital filter in response to a detection of the at least one candidate signal of unwanted acoustical feedback (4,9);

processing the digital input signals through the at least one digital filter to generate digital output signals (3);

converting the digital output signals to electrical output signals (5);

testing the electrical output signals by broadcasting the electrical output signals through the at least one speaker to generate new input signals and analyzing the effect of processing the digital input signals (Figs. 2, 12, 14, and 16); and

readjusting the at least one digital filter by decreasing a depth of the at least one digital filter if a magnitude of the at least one candidate signal of unwanted acoustical feedback is not reduced by a predetermined amount, such that the unwanted acoustical feedback in the space is reduced (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 27; column 9, lines 14-41).

12. Regarding Claim 8, Seki discloses increasing the depth of the at least one digital filter if a magnitude of the at least one candidate signal of unwanted acoustical feedback is reduced by a predetermined amount (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27; column 9, lines 14-41).

13. Regarding Claim 9, Seki discloses transforming the digital input signals into a frequency spectrum to produce a plurality of bin values wherein each bin value represents a function of an amplitude of the digital input signals across a frequency spectrum bandwidth (7)(Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 27).

14. Regarding Claim 10, Seki discloses the function is a sum of a square of a real component of the amplitude of the digital input signals and a square of an imaginary component of the amplitude of the digital input signals (i.e. it is inherent to take the sum of a square of a real component of the amplitude and a square of an imaginary component of the amplitude, in order to calculate a magnitude)(Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 27).

15. Regarding Claim 11, Seki discloses the function is a square root of a sum of a square of a real component of the amplitude of the digital input signals plus a square of an imaginary component of the amplitude of the digital input signals (i.e. it is inherent to take the square root of a sum of a square of a real component of the amplitude plus a square of an imaginary component of the amplitude, in order to calculate a magnitude)(Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 27).

16. Regarding Claim 12, Seki discloses establishing a set of candidates comprising a predetermined number of bin values with largest magnitudes (841,843,844,845), testing

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each candidate in the set of candidates by determining an acoustical significance of each candidate and removing the respective candidate from the set of candidates if the respective candidate is not acoustically significant, and determining the at least one candidate signal of unwanted acoustical feedback from the set of candidates (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27).

17. Regarding Claim 13, Seki discloses determining an average value which is a function of the magnitudes of the predetermined number of bin values (42,46); comparing the bin value of each candidate in the set of candidates to an absolute value and removing the respective candidate from the set of candidates if the respective bin value of the respective candidate is less than the absolute value; and comparing the bin value of each candidate to a relative value, and removing the respective candidate from the set of candidates if the bin value of the respective candidate is less than the relative value, wherein the relative value is a function of the average value and a relative multiplier (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27; column 7, lines 10-34).

18. Regarding Claim 14, Seki discloses the relative multiplier is a function of the magnitudes of the predetermined number of bin values (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27; column 7, lines 10-34).

19. Regarding Claim 15, Seki discloses the magnitudes are calculated by a process which includes: transforming the digital input signals into a frequency spectrum to generate a plurality of new bin values wherein each new bin value represents the function of an amplitude of the digital input signal across the frequency spectrum



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bandwidth (column 5, line 56 to column 6, line 26), comparing the new bin value to at least one of the predetermine number of bin values (column 5, line 56 to column 6, line 26), setting at least one of the predetermine number of bin values to the new bin value when the new bin value is less tan the at least one of the predetermined number of bin values (column 5, line 56 to column 6, line 26), and setting the at least one of the predetermined number of bin values to a filtered value when the new bin value is greater than the at least one of the predetermined number of bin values (column 5, line 56 to column 6, line 26).

20. Regarding Claim 19, Seki discloses a method of reducing unwanted acoustical feedback in a plurality of sound signals, the method comprising:

sampling the plurality of sound signals at predetermined intervals to create a set of sampled sound signals (Figs. 2, 12, 14, and 16; column 4, line 66 to column 5, line 22);

transforming a sound signal from the set of sampled sound signals, to a frequency spectrum comprising a plurality of frequency bins, each bin having a new bin value which is a function of a magnitude of a frequency of the sound signal over a predetermined frequency width (Figs. 2, 12, 14, and 16; column 4, line 66 to column 5, line 30);

comparing each new bin value to a bin value (column 5, line 56 to column 6, line 26);

setting the bin value to a new bin value when the new bin value is less than the bin value (column 5, line 56 to column 6, line 26);

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setting the bin value to a filtered value when the new bin value is greater than the stored bin value (column 5, line 56 to column 6, line 26);

selecting a set of candidate frequency from the bin value having the largest values (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 55);

testing an acoustic significance of each candidate frequency in the set of candidate frequencies and removing a respective candidate frequency from the set of candidate frequencies if the respective candidate is not acoustically significant, such that at least one candidate feedback frequency is determined (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 64; column 9, lines 14-41);

adjusting at least one notch filter to filter the at least one candidate feedback frequency (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 64; column 9, lines 14-41);

processing the plurality of sound signals through the at least one notch filter (Figs. 2, 12, 14, and 16);

readjusting the at least one notch filter to filter for the at least one candidate frequency wherein the at least one notch filter's depth is decreased if the at least one candidate feedback frequency has not been reduced by a predetermined amount, such that unwanted acoustical feedback is reduced (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 64; column 9, lines 14-41).

21. Regarding Claim 20, Seki discloses the readjusting step further comprises increasing the at least one notch filter's depth if the at least one candidate feedback

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frequency has been reduced by a predetermined amount (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 64; column 9, lines 14-41).

22. Regarding Claim 21, Seki the testing an acoustical significance of each candidate frequency comprises: determining an average value which is a function of an average of the plurality of bin values; comparing the bin value of each candidate frequency in the set of candidate frequencies to an absolute value and removing the respective candidate frequency from the set of candidate frequencies if a respective bin value of the respective candidate frequency is less than the absolute value; and comparing the respective bin value of each candidate frequency to a relative value, and removing the respective candidate frequency from the set of candidate frequencies if the respective bin value of the respective candidate frequency is less than the relative value, wherein the relative value is a function of the average value and a relative multiplier (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 26; column 7, lines 10-34).

23. Regarding Claim 22, Seki discloses the relative multiplier is a function of the magnitudes of the plurality of frequency bin values (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27; column 7, lines 10-34).

24. Regarding Claim 26, Seki discloses a system for reducing unwanted acoustical feedback (i.e. feedback detector and suppressor) comprising:

- at least one processor (Figs. 2, 12, 14, and 16);

- at least one memory accessible to the at least one processor (10); and

- programming comprising instructions for:

examining a plurality of digital input signals for at least one candidate signal of unwanted acoustical feedback (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27);

adjusting at least one digital filter (3) in response to a detection of the at least one candidate signal;

processing the digital input signals through the at least one digital filter to generate digital output signals (Figs. 2, 12, 14, and 16);

converting the digital output signals to audio output signals (5);

testing the audio output signals by broadcasting the audio output signals through a speaker to generate new audio input signals and analyzing the effect of processing the digital input signals (i.e. output signal from the output terminal 6 is reproduced by a speaker)(column 5, lines 1-22); and

readjusting the at least one digital filter by decreasing the depth of the at least one digital filter if the magnitude of the at least one candidate signal is not reduced by a predetermined amount, such that the unwanted acoustical feedback in the space is reduced (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 27; column 9, lines 14-41).

25. Claim 27 is essentially similar to Claim 8 and is rejected for the reasons stated above apropos to Claim 8.

26. Claim 28 is essentially similar to Claim 9 and is rejected for the reasons stated above apropos to Claim 9.

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27. Claim 29 is essentially similar to Claim 10 and is rejected for the reasons stated above apropos to Claim 10.

28. Claim 30 is essentially similar to Claim 11 and is rejected for the reasons stated above apropos to Claim 11.

29. Claim 31 is essentially similar to Claim 12 and is rejected for the reasons stated above apropos to Claim 12.

30. Claim 32 is essentially similar to Claim 13 and is rejected for the reasons stated above apropos to Claim 13.

31. Claim 33 is essentially similar to Claim 14 and is rejected for the reasons stated above apropos to Claim 14.

32. Claim 34 is essentially similar to Claim 15 and is rejected for the reasons stated above apropos to Claim 15.

33. Regarding Claim 38, Seki discloses an apparatus for reducing unwanted acoustical feedback (i.e. feedback detector and suppressor) in a space having at least one microphone for transducing acoustic signals into electrical input signals (i.e. input terminal 1 is connected to an external microphone) and at least one speaker for transducing electrical output signals into acoustic signals (i.e. output signal from the output terminal 6 is reproduced by a speaker)(column 5, lines 1-22), the apparatus comprising:

an analog-to-digital converter (2) which converts the electrical input signals to digital input signals;

at least one processor coupled to the analog-to-digital converter (Figs. 2, 12, 14, and 16);

a memory accessible to the at least one processor for storing software modules (4,10,841), including an examining module to examine the digital input signals for candidate feedback frequencies (7,8),

at least one digital notch filter (3) implemented in the at least one processor which processes the digital input signals and wherein the at least one processor determines parameters for the at least one digital notch filter in response to a detection of at least one candidate frequency in at least one of the digital input signal (Figs. 5, 6, 8, and 9; column 5, line 56 to column 6, line 27),

a digital to analog converter (5) coupled to the processor configured to convert the digital output signals to electrical output signals, and

a testing module which decreases the notch depth parameter if a magnitude of the at least one candidate frequency is not reduced by a predetermined amount (Figs. 2, 12, 14, and 16; column 5, line 56 to column 6, line 27; column 9, lines 14-41).

34. Claim 39 is essentially similar to Claim 8 and is rejected for the reasons stated above apropos to Claim 8.

35. Claim 40 is essentially similar to Claim 9 and is rejected for the reasons stated above apropos to Claim 9.

36. Claim 41 is essentially similar to Claim 10 and is rejected for the reasons stated above apropos to Claim 10.

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37. Claim 42 is essentially similar to Claim 11 and is rejected for the reasons stated above apropos to Claim 11.

38. Claim 43 is essentially similar to Claim 12 and is rejected for the reasons stated above apropos to Claim 12.

39. All elements of Claim 44 are comprehended by Claim 38. Claim 44 is rejected for the reasons stated above apropos to Claim 38.

40. Claim 45 is essentially similar to Claim 13 and is rejected for the reasons stated above apropos to Claim 13.

41. Claim 46 is essentially similar to Claim 14 and is rejected for the reasons stated above apropos to Claim 14.

42. Claim 47 is essentially similar to Claim 15 and is rejected for the reasons stated above apropos to Claim 15.

#### ***Allowable Subject Matter***

43. Claims 16-18, 23-25, 35-37, 48-50 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Response to Arguments***

44. Applicant's arguments filed 10/28/2005 have been fully considered but they are not persuasive.

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With respect to Applicant's argument on page 16, stating that "at least Figure 11 shows the feature of "removing the at least one notch filter if the amplitude of the frequency being tested has not been reduced by at least the predetermined value." Therefore, Applicant requests that the Examiner remove the objection to the Drawings", has been noted. However, the Examiner respectfully disagrees. Figure 11 discloses "set filter to bypass" which is not equivalent to **"removing the at least one notch filter** if the amplitude of the frequency being tested has not been reduced by at least the predetermined value" because removing requires for example, to move the at least one notch filter from a place or position occupied; to transfer or convey from one place to another; to take off; or to take away, etc.

45. With respect to Applicant's argument on page 17, stating that "at least at page 17, lines 4-27, describes "removing the at least one notch filter if the amplitude of the frequency being tested has not been reduced by at least a predetermine value" sufficiently to enable one skilled in the art to make and use the claimed invention", has been noted. However, the Examiner respectfully disagrees. The specification discloses "the parameters of the notch filter are set to "bypass" in step 1110 (which can also be done by setting the notch depth to 0 db causing the filter to have no effect on the audio signal", which is not equivalent to **"removing the at least one notch filter** if the amplitude of the frequency being tested has not been reduced by at least the predetermined value" because removing requires for example, to move the at least one notch filter from a place or position occupied; to transfer or convey from one place to another; to take off; or to take away, etc.



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46. With respect to Applicant's argument on page 19, stating that "the one time application to a notch filter of a predetermined coefficient extracted from a memory is completely different from the readjustment of a digital filter described in Claims 7 and 26. There is no indication in Seki that individual filter depths are readjusted if the magnitude of the candidate signal of unwanted acoustical feedback is not reduced by a predetermined amount as described in Claims 7 and 26. For purposes of discussion, even if Seki did teach re-adjustment of filter depths, which is clearly not the case, Seki does not teach readjusting if a magnitude of the at least one candidate signal of unwanted acoustical feedback is not reduced by a predetermined amount as further described in Claims 7 and 26. To the contrary, Seki is not at all concerned about an amount of reduction in magnitude since the predetermined stored coefficient taught by Seki apparently eliminates the center frequency fm when the stored coefficient is applied to the notch filter", has been noted. However the Examiner respectfully disagrees. Seki does disclose readjusting readjusted if the magnitude of the candidate signal of unwanted acoustical feedback is not reduced by a predetermined amount, see column 9, lines 14-42.

47. With respect to Applicant's argument on page 20, regarding claim 38, has been noted. However, the Examiner respectfully disagrees. See argument above.

### ***Conclusion***

48. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

49. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey P. Chau whose telephone number is (571)272-7514. The examiner can normally be reached on Monday - Friday 9:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on (571)272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

February 6, 2006  
CPC

  
HUYEN LE  
PRIMARY EXAMINER